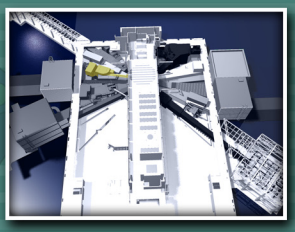
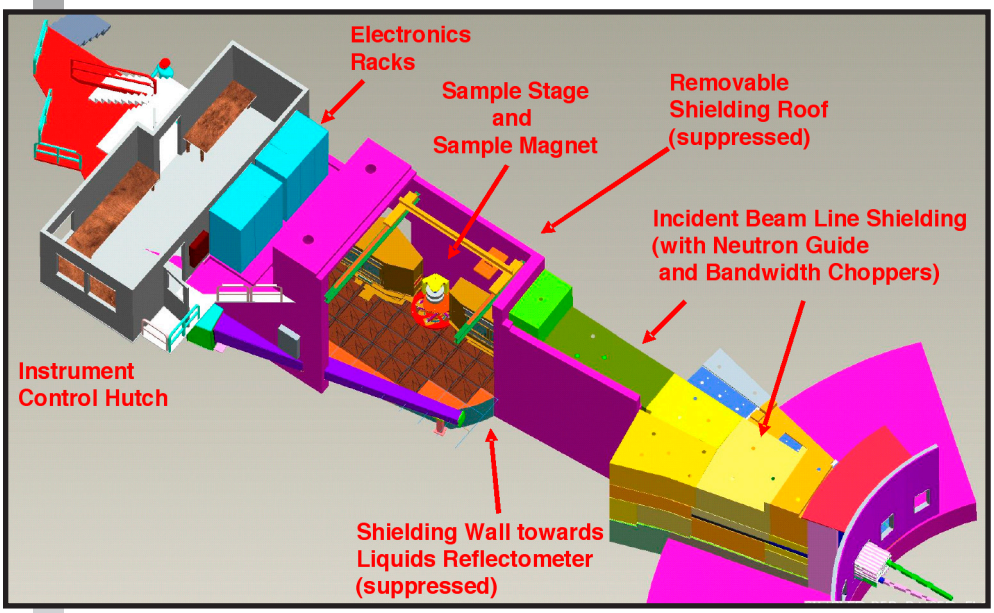
Instrument Fact Sheet

BEAM LINE 4A



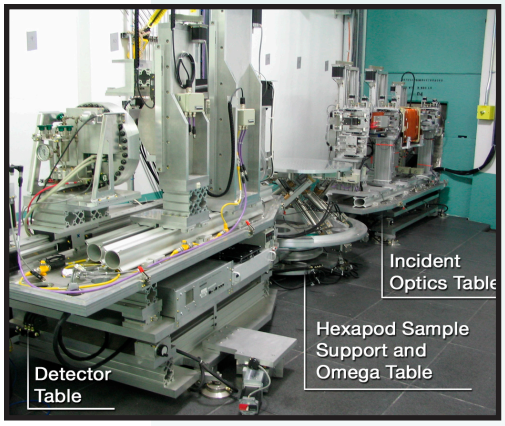
Magnetism Reflectometer

The magnetism reflectometer is designed for reflectometry and high-angle diffraction studies of magnetic thin films, superlattices, and surfaces. The combination of the high-power SNS neutron source and the use of advanced neutron optics will also allow off-specular diffraction studies of in-plane structures. Today, even at the world's most advanced neutron sources, such experiments are extremely difficult to perform. The availability of polarized neutrons and polarization analysis suggests that the instrument will also be used for specific studies of nonmagnetic thin-film samples. Examples for the latter case include contrast variation, incoherent background reduction, and phase determination for direct inversion of reflectivity data into real-space scattering-length density profiles.



Specifications

Source-sample distance	18.64 m
Sample-detector distance	0.5 – 6 m
Detector size	20 • 20 cm^2
Detector resolution	1.5 mm
Moderator	coupled supercritical hydrogen
Bandwidth	$\Delta\lambda$ = 3.1 Å
Wavelength range	1.8 Å < λ < 14.0 Å
Q range	0 $Å^{-1}$ < Q < 7.0 $Å^{-1}$
Minimum reflectivity	10^{-9} – 10^{-10}
Detector area	18 cm x 18 cm



Magnetism reflectometer

Recent Significant Events

Instrument Construction

- Instrument construction is complete.
- The instrument safety review was conducted on June 1, 2006.
- Commissioning will start in July 2006.

Instrument Science

- Outfitting of a lab for neutron polarization equipment is under way.
- A workshop on high-magnetic field science was held at the National High Magnetic Field Laboratory.

For more information, contact Magnetism Reflectometer staff

Instrument Scientist: Frank Klose, klosefr@sns.gov, (865) 576-5389
Lead Engineer: Tim Chae, chaet@sns.gov, (865) 241-6740
Electrical Engineer: Andre Parizzi, parizziad@sns.gov, (865) 576-6219
Scientific Associate: Richard J. Goyette Jr., goyetterj@sns.gov, (865) 241-9991

www.sns.gov/users/instrument_systems/instruments/elastic/magnet.shtml

SNS

June 2006

05-03085A/arm